TREBING + HIMSTEDT

CommDTM PROFIBUS DP-V1

Doc. Version 4.0

User Manual

English

Dear Customer,

This »User Manual« describes the functionalities of the CommDTM PROFIBUS DP-V1 in a FDT frame application. If you have any further questions, please contact our Technical Support:

Trebing & Himstedt Prozeßautomation GmbH & Co. KG
Technical Support
Wilhelm-Hennemann-Str. 13
19061 Schwerin | Germany

Phone: +49 385 39572-500
Fax: +49 385 39572-22
E-mail: support@t-h.de
Internet: http://www.t-h.de

The information contained in this »User Manual« is the property of Trebing & Himstedt Prozeßautomation GmbH & Co. KG. The »User Manual« and extracts thereof may only be duplicated or forwarded to third parties following explicit written approval by Trebing & Himstedt Prozeßautomation GmbH & Co. KG. We reserve the right to make changes and improvements to this »User Manual« as well as the hardware and software features at any time and without prior notification.

All product names used herein are trademarks or otherwise protected by law, even if not specifically indicated.

© 2005-2010 | Trebing & Himstedt Prozeßautomation GmbH & Co. KG

Doc. Version 4.0 | January 2010

Content

CommDTM PROFIBUS DP-V1 4
FDT Frame Applications 5

Context Menu 6
Configuration 7
Change Device Addresses 13
DTM Addresses 15
PROFIBUS Diagnosis 18
Telegram Logger 24
Engineering Data 29
xEPI 2 Website 31
About CommDTM PROFIBUS DP-V1 32
Help 33

Licensing 34

Example Application 36
Design Projects 36

General Conditions 39

CommDTM PROFIBUS DP-V1

The Trebing & Himstedt Prozeßautomation GmbH & Co. KG CommDTM PROFIBUS DP-V1 can be used in all FDT frame applications (such as FieldCare or PACTware). It allows communication between PROFIBUS-PA devices, HART devices – connected to the PROFIBUS via Remote I/O (RIO) with HART functionality – and their deviceDTMs. This can be done either centrally through the xEPI 2, or locally (on-site operation in the field) through a PROFIBUS communication processor (CP5512, CP5611 PC card or Field PG with integrated CP5611). The PROFIBUS communicates acyclically (DP-V1) and parallel to the master class 1 (MCL1) as a configuration master MCL2. For communication with the field device, the respective deviceDTM has to be integrated into the project of the FDT frame application.

You can use the CommDTM PROFIBUS DP-V1 concurrently severalfold within one FDT frame application by multiple loading of the CommDTM PROFIBUS DP-V1 into the project window. A respective physical access to the PROFIBUS needs to be available for each loaded CommDTM PROFIBUS DP-V1 for communication (xEPI 2 | CP5512 | CP5611 hardware).

The CommDTM PROFIBUS DP-V1 is protected by software key. You need to license the software. For respective notes and tips, please refer to the Installation Guide of the Trebing + Himstedt DTM Library.

CommDTM PROFIBUS DP-V1 functionalities can be accessed through the context menu of the used FDT frame application.

FDT Frame Applications

The different FDT frame applications vary in functionality and appellation of the various functions. This user manual refers to the »FieldCare« frame application with regard to appellations. Complete functions for the frame application are described in the FieldCare help.

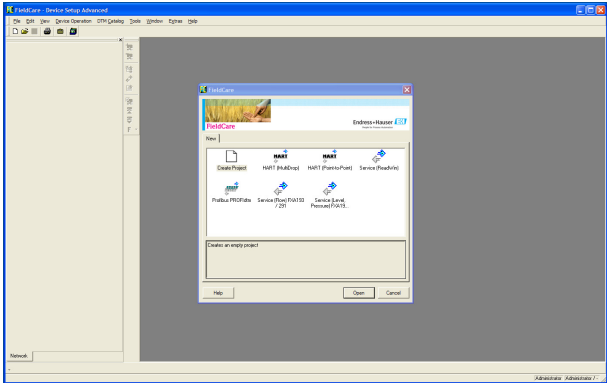

Fig. 1: FieldCare

Context Menu

Click **CommDTM PROFIBUS DP-V1** in the project window of the FDT frame application with the right mouse key. The context menu opens. Its entries are default entries of the FDT frame application. When you select **Additional Functions**, the CommDTM PROFIBUS DP-V1 entries are displayed. Functionalities in gray font are not supported or already opened. An online connection may be required to access these functionalities.

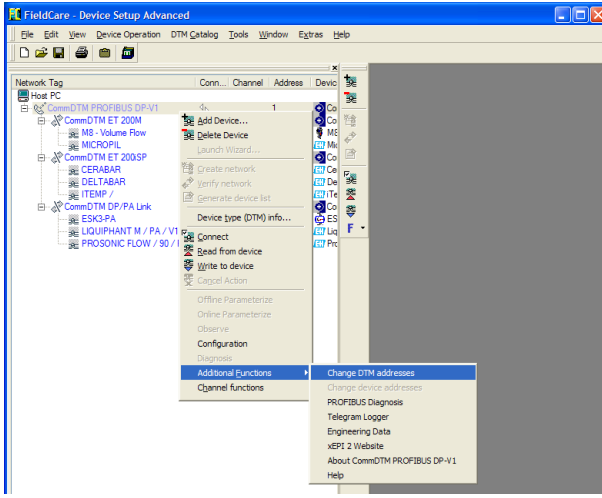

Fig. 2: Context menu for the CommDTM PROFIBUS DP-V1

Note!
The tag name depends on the FDT frame application. For example the tag name in FieldCare is CommDTM PROFIBUS DP-V1 and in PACTware T+H PB MCL 2.

Configuration

In this window, you select the hardware (physical access to the PROFIBUS) for the CommDTM PROFIBUS DP-V1. Access can be realized through the xEPI 2 or a PC card (CP5512/CP5611). Here you set specific PROFIBUS parameters (bus parameters) for the selected hardware. This function is only available in offline mode.

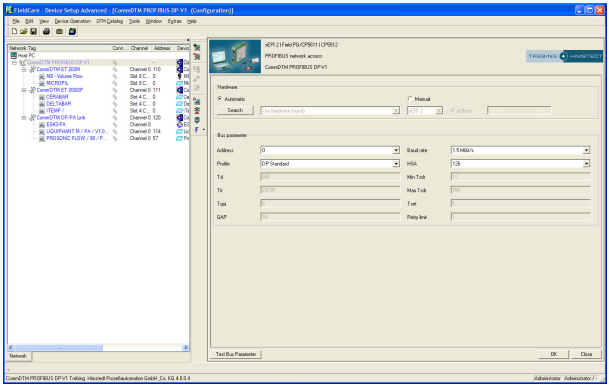

Fig. 3: Hardware configuration

Procedure:

– Click **CommDTM PROFIBUS DP-V1** in the project window with the right mouse key and select **Configuration**.

– Select the hardware. You can decide to search automatically or to enter the hardware manually.
Automatic: Click the **Search** button and select in the list box the available hardware. (hardware must be installed or rather xEPI 2 must be found in the network).
The identified hardware is displayed as follows:
CP cards:<Card type> Channel: <Channel number>
xEPI 2: <Host name> (<IP address>)
The hardware is identified and displayed by multi-cast request via Ethernet. If your network does not support this functionality (e.g. blocked by firewall or router), no hardware or local hardware only will be displayed. In this case, you can set the hardware manually.
Manual: Select the device from the list box. If you select the xEPI 2, you can enter the IP address afterwards in the field next to the list box. If you select a CP-card, enter the respective channel in the list box aside.

– Set the PROFIBUS parameters. Adjust the following settings:
Address*:* Click on the list box. Select the respective PROFIBUS address.
Baud rate: Click on the list box. Select the respective baud rate for the PROFIBUS network.
Profile*:* Click on the list box. Select the respective profile. Bus parameters are displayed for the selected profile. In the »DP Standard«, »Universal (DP/FMS)« and »Pepperl+Fuchs« profiles, you can only change the HSA. If you want to modify further bus parameters, select »User defined« from the list box.

Click then into the respective parameter field and carry out your settings.

Attention!
We strongly recommend application of the standard profiles on all masters in the PROFIBUS network. Manual setting of bus parameters requires extensive PROFIBUS knowledge. If the other masters do not use standard profiles, please use the parameters of these other masters.

– Click the button **`Test Bus Parameter`** to check, whether the set bus parameters are correct. In case of errors the incorrect values are marked with an exclamation mark. The corresponding error message is displayed in the window **`Saved DTM messages`**.
– Click **`OK`**.

Note!
The PROFIBUS address (device address) can only be assigned once in a PROFIBUS network. Bus parameters must be identical for all stations in this network.

Explanations for the CommDTM PROFIBUS DP-V1 Window (Configuration)

Hardware	Hardware selection for application of xEPI 2, CP5512 or CP5611.
Address	Address in the PROFIBUS network
Baud rate	Baud rate of the PROFIBUS network
Profile	Selection of bus parameter profiles In the preset »DP Standard«, »Universal (DP/FMS)«, »Pepperl+Fuchs« profiles, you can only change the HSA. If you want to modify further bus parameters, select »User defined« from the list box. Then click into the respective description field and adjust your settings.
HSA	Highest Station Address States the highest valid station address in the PROFIBUS network.
Tsl	Slot time This time determines the maximum time the sender waits for a response from the addressed station.
Min Tsdr	Min station delay responder This time determines the minimum delay after which the responding station shall answer at the earliest.

Max Tsdr Max station delay responder
This time determines the maximum delay after which the responding station shall have answered at the latest.

Ttr Target rotation time
This time is the maximum time available for one Token rotation. In this time span, all DP masters receive the Token once.

Tqui Quiet time for modulator
This is the time a station needs for switching from sending to receiving after telegram end.

Tset Setup time
This is the time that may pass between receiving a data telegram and the respective reaction of the station.

GAP GAP factor
Specifies after how many bus rotations the master searches for new active stations in order to include them into the bus and send the Token to these stations. The GAP range lies between the own and the subsequent station address (exception: the range of the highest station address up to address 127 does not belong to the GAP range).

Retry limit Maximum number of call retries
Determines the maximum number of telegram retries carried out to reach a station.

CommDTM Application with Siemens CP5512 and CP5611

To use the CommDTM with Siemens CP5512/CP5611 hardware, you first need to activate the Trebing + Himstedt driver. This can be done via the entry in the Windows start menu: **START > Programs > Trebing + Himstedt > DTM Library > Activate T+H Driver**.

If you want to use the CP5512/CP5611 with another application and the Siemens driver again, you first need to activate this driver. This can be done via the entry in the Windows start menu: **START > Programs > Trebing + Himstedt > DTM Library > Activate Siemens Driver**.

Note!

For hardware modifications on your PC, including driver switching, you need to have the respective administrational rights and authorizations. If you encounter any problems, please contact your administrator.

Change Device Addresses

With this function, you can display and modify PROFIBUS addresses of the connected devices. This functionality is only available in online mode. Device addresses can only be changed if the respective device supports this function.

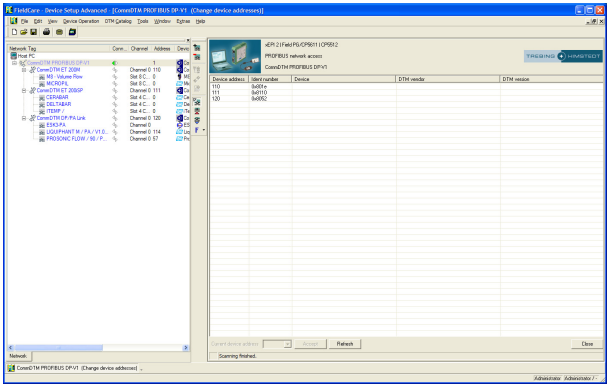

Fig. 4: Change device addresses

Procedure for device address modification:

– Click **`CommDTM PROFIBUS DP-V1`** in the project window with the right mouse key and select **`Establish Connection`**. The existing online connection is displayed in the FDT frame application (see Help for »FDT Frame Application«).

– Click **CommDTM PROFIBUS DP-V1** in the project window with the right mouse key and select **Additional Functions > Change device addresses**.
  The scan procedure after devices is performed by clicking the **Refresh** button. Afterwards the devices are listed in the **Change device addresses** window. Respective device names, DTM vendors and DTM versions can only be displayed if this functionality is supported by the frame application.
– Mark the respective device.
– Select a new address from the list box in the bottom part of the window and click **Accept**. Automatically, an online connection to the device is established, the address is modified, and the device disconnected. In the status bar of the window, information is displayed on whether this function has been completed successfully, or whether the device does not support this functionality.

Attention!
After device address modification, you need to set the DTM address of the respective CommDTM or deviceDTM to the same address.

Note!
Not all devices support device address setting through the CommDTM PROFIBUS DP-V1. Device addresses for some devices can only be set directly at the device. For respective information, please refer to the manual of the respective device manufacturer.

DTM Addresses

Set DTM Address

Procedure for setting DTM address:

– Click **CommDTM PROFIBUS DP-V1** in the project window with the right mouse key and select the function **Add device**.
– Select a device from the device catalog and click **OK**. The window for setting DTM addresses appears.
– Set the DTM address and click **OK**.

Change DTM Addresses

With this function, you can display and change DTM addresses of subordinate CommDTMs or deviceDTMs. This function is only available in offline mode. The DTM address shown and set is used to establish connection to the respective device. Please make sure to use an identical address both for the device and for its respective DTM.

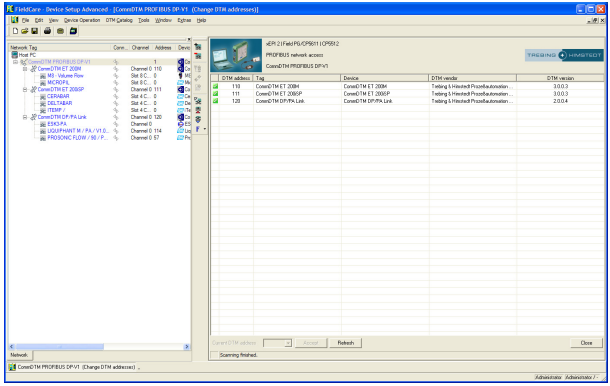

Fig. 5: Change DTM addresses

Procedure for changing DTM address:

– Click **CommDTM PROFIBUS DP-V1** in the project window with the right mouse key and select **Additional Functions > Change DTM addresses**. The scan procedure is performed by clicking the **Refresh** button. Afterwards the devices are listed in the **Change DTM addresses** window. Respective device names, DTM vendors and DTM versions can only be displayed if this functionality is supported by the frame application.
– Mark the respective DTM.

– Select a new address for the deviceDTM in the **`Current DTM address`** list box and then click **`Accept`**. In the status bar of the window, information is displayed on whether this function has been completed successfully, or whether the device does not support this functionality.

Note!
This function is not supported by all DTM. In this case, you can only modify DTM addresses directly through the deviceDTM in the project. Every PROFIBUS address must only be assigned once in a PROFIBUS network.

PROFIBUS Diagnosis

With this function, you can display PROFIBUS Diagnosis for the xEPI 2 that is set in configuration. This function is available in online and offline mode of the xEPI 2. The refresh of the interface is automatic and occurs each 30 seconds. To make handling easier tooltips are situated on each element to explain the interface.

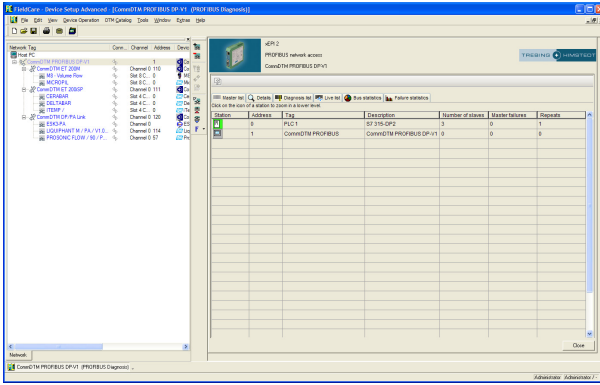

Fig. 6: PROFIBUS Diagnosis

Note!
To display diagnosis information in the CommDTM PROFIBUS DP-V1, you need to start the PROFIBUS diagnosis measurements in the xEPI 2 settings (see Installation Guide of the xEPI 2).

CommDTM PROFIBUS DP-V1 contains the following sections and views:

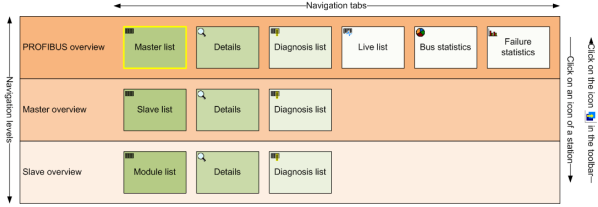

Fig. 7: Sections and views of the CommDTM PROFIBUS DP-V1

To get into deeper sections click on the icon of one station.

To get into higher sections click on the button that is arranged above the tabs.

PROFIBUS Overview

By default you are in the PROFIBUS overview in the master list after opening the PROFIBUS diagnosis. (see »Sections and views of the CommDTM PROFIBUS DP-V1« on page 19 - yellow bordered)

Master list

The master list displays the masters with their addresses, Tags, descriptions, number of slaves, master failures and repeats.

Details

The details display detailled information of the PROFIBUS network.

Diagnosis list

The diagnosis list displays the diagnoses with timestamp of the complete PROFIBUS network. The record starts simultaneously with the measurements in the xEPI 2. Range your mouse on the diagnosis detail cells to get advices for troubleshooting.

Live list

The live list displays all stations of the PROFIBUS strand with its status. Station icons indicate the status.

Bus statistics

The bus statistic displays the masters of the PROFIBUS network with its current status. You receive the address of stations, the Tag and the information of the supported protocol types.

In addition you get the time in which a slave has to reply to a DP-V0 master and the time for one DP cycle of the master. The bandwidth of the master present the data volume in percentage. Furthermore the data rate of the master is the absolute reference data that is exchanged per DP cycle. In the last column you can set or delete the checkmark for a master to visualize or to exclude the master from the protocol proportion and the bandwidth proportion of the selected masters.

Note!
If the xEPI 2 is active as master class 2 in the PROFIBUS information to protocol and bandwidth are unascertainable. Than this fields are greyed.

Failure statistics

The failure statistic displays the stations in a table with failures and repeats.

The graphical interpretation of failures and repeats of all masters and slaves are presented among the table as long as the checkmark is set in the graphic column.

If diagnostic repeater, DP/PA Link or SK3 are identified in your PROFIBUS network, than the following tables are visualized:

– The table for the diagnostic repeater displays an overview of failure and reflexion rates of the segments of the diagnosis repeater.
– The table for the DP/PA Link displays an overview of PA devices of the DP/PA Link.

– The table for the SK3 displays an overview of PA segments of the SK3.

Note!
If the xEPI 2 is active as master class 2 in the PROFIBUS, information to repeats are unascertainable. Than this fields are greyed.

Master Overview

Slave list

The slave list displays the slaves with their addresses, Tags, descriptions, slave IDs, slave failures and repeats.

Details

The details display detailled information to the master.

Diagnosis list

The diagnosis list displays the diagnoses with timestamp of the chosen master. The record starts simultaneously with the measurements. Range your mouse on the diagnosis detail cells to get advices for troubleshooting.

Slave Overview

Module list

The module list displays the modules with their slots, Tags, descriptions and known values/configuration.

Details

The details display detailled information to the slave.

Diagnosis list

The diagnosis list displays the diagnoses with timestamp of the chosen slave. The record starts simultaneously with the measurements. Range your mouse on the diagnosis detail cells to get advices for troubleshooting.

Telegram Logger

Using the xEPI 2 you can record the communication of the CommDTM PROFIBUS DP-V1 with this function.

User interface

Two tables are used for the visualization of the telegrams, a telegram table and a table for details.

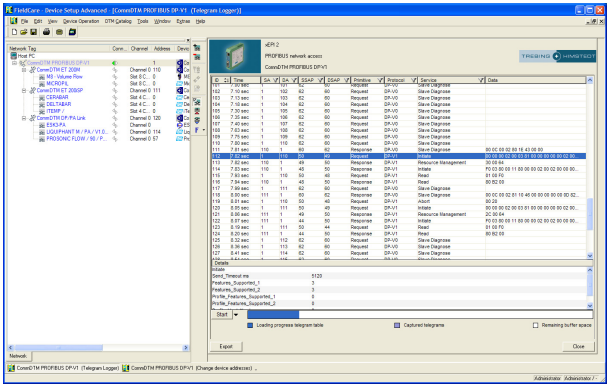

Fig. 8: Telegram Logger

Note!

If telegrams exceed the width of the column in the telegram table, you have to select the telegram to display all data in the table for details.

Die telegram table consists of 10 columns that are named as follows:

ID	Description
ID	Each telegram entry has an ID, started with the ID 0, all other entries are numbered consecutively.
Time	Time in seconds between the start of the measurement and the measurement time of the telegram.
SA	Source Address Address of the station that provided the telegram.
DA	Destination Address Address of the station that received the telegram.
SSAP	Source Service Access Point Service access point of the providing station for explicit identification of the data within a telegram.
DSAP	Destination Service Access Point The destination station decides by means of DSAP which service has to be performed.
Primitive	e.g Response, Request, Repeat Request or Acknowledge
Protocol	Here the protocol type is shown. (FDL, DP-V0, DP-V1)
Service	Here the telegram type is shown. (e.g. Slave diagnosis, Idle)
Data	Displays the telegram. Select a telegram to visualize the complete data in the table for details.

The detail table displays the details of the selected telegrams.

The progress bar is situated under the detail table. The bar is white after opening the telegram logger to signal the remaining buffer space. Starting the record the color changes to purple for the captured telegrams and blue for the loading progress of the telegram table. The recording buffer has a maximum memory capacity of 1000 telegrams.

Note!
If the connection to xEPI 2 is interrupted during the record, the progress bar color changes to red. Afterwards the telegram logger has to be restarted.

Record telegrams

Procedure for recording telegrams:

– Click **`CommDTM PROFIBUS DP-V1`** in the project window with the right mouse key and select **`Additional Functions > Telegram Logger`**. The telegram logger opens.
– Click **`Start`** to start the record. Afterwards the start button changes to the **`Stop`** button. Click **`Stop`** to end the record. Afterwards the button changes back to the **`Start`** button.

Note!
If the connection to xEPI 2 is interrupted during the record, the Start-Stop button is inactive. The telegram logger has to be restarted.

Note!
The recorded telegrams are available as long as the window telegram logger is open. If you close the window the telegrams are lost. Click the button Export for saving the telegrams.

An arrow is diplayed next to the start button. Click the arrow to open a context menu with the entries **`Log FDT traffic`** and **`Log all traffic`**.

– Select **`Log FDT traffic`** to record only telegrams of the FDT traffic. This function is performed by default.
– Select **`Log all traffic`** to record all telegrams of the types DP-V0, DP-V1 and FDL.

During and after telegram recording you can perform the following functions:

– Sort
– Filter
– Scroll
– Display details to telegrams
– Export (see »Export telegrams« on page 28)

Filter telegrams

You can filter the telegrams with the help of the view filter.

Procedure for filtering telegrams:

– Click the filter icon in the heading of the particular column to set filter. Use the scroll bar to get to further selection criteria if more than 7 elements are available.

– Select one or several filter elements. The filter icon becomes blue for set filter.
– The entry **`delete all`** delete all set filters of the particular column. The filter icon is inactive again.

Note!
The columns SA and DA, as well as SSAP and DSAP, use in each case a common filter to display alle telegrams of one station. The selection of one value in the filter of one column is taken over to the value for the second column too.

Sort telegrams:

Click the symbol in the heading of the column ID for sorting telegrams upward and downward.

Export telegrams

Procedure for exporting telegrams:

– To record telegrams repeat the steps under »Record telegrams« on page 26.
– Click the **`Export`** button afterwards to transfer the loaded telegrams.
– Select the directory where you want to save the file and a file format (csv or xml). Enter a file name and press the button **`Save file.`**

Engineering Data

Using the xEPI 2 you can transmit tags and descriptions of the FDT project to xEPI 2 with this function.

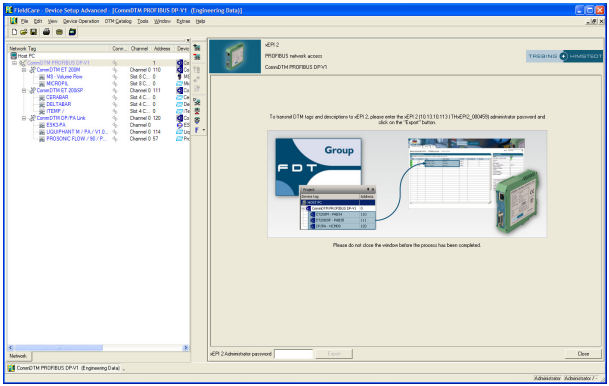
FieldCare - Device Setup Advanced - [CommDTM-PROFIBUS DP-V1 (Engineering Data)]
xEPI 2
PROFIBUS network access
CommDTM PROFIBUS DP-V1
TREBING HIMSTEDT
To transmit DTM tags and descriptions to xEPI 2, please enter the xEPI 2 [10.13.115.113 | TH-EPI2_000459] administrator password and click on the "Export" button.
Group
FDT
Please do not close the window before the process has been completed.
xEPI 2 Administrator password
Export
Close

Fig. 9: Engineering Data

Procedure for exporting engineering data:

– Click **`CommDTM PROFIBUS DP-V1`** in the project window with the right mouse key and select **`Additional Functions > Engineering Data`**. An additional window opens that enables the export of the engineering data.
– Enter the administrator password for the xEPI 2 (default: serial number of the xEPI 2. You find further information in the installation guide of the xEPI 2.).

– Afterwards click the button **Export** to transmit the tags and descriptions of the FDT project in the xEPI 2.

Note!

If there are already existing tags and descriptions on the xEPI 2, you are asked to replace the data. Click **No** to cancel the process.

If the tags and descriptions exceed the limits, you are asked to cut at the maximum. Click **No** to cancel the process.

xEPI 2 Website

With this function, you can open the xEPI 2 website for the xEPI 2 that is set in configuration.

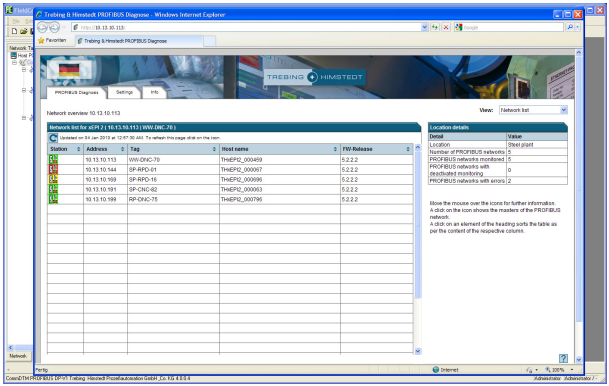

Fig. 10: xEPI 2 Website

Procedure for opening the xEPI 2 website:

– Click **`CommDTM PROFIBUS DP-V1`** in the project window with the right mouse key and select **`Additional Functions > xEPI 2 Website`**. The Internet Explorer opens to display the xEPI 2 website.

About CommDTM PROFIBUS DP-V1

This function displays information on the installed CommDTM PROFIBUS DP-V1.

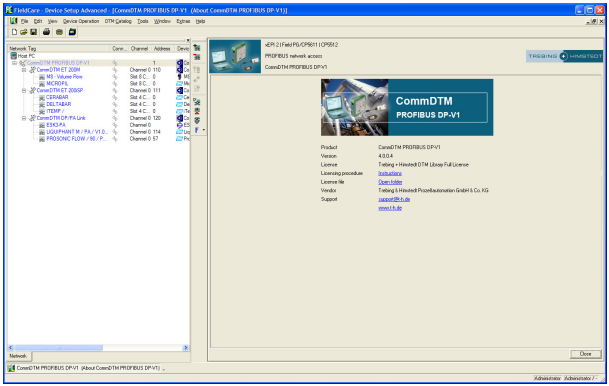

Fig. 11: About CommDTM PROFIBUS DP-V1

Procedure for opening the window About CommDTM PROFIBUS DP-V1:

– Click **`CommDTM PROFIBUS DP-V1`** in the project window with the right mouse key and select **`Additional Functions > About CommDTM PROFIBUS DP-V1`**. The information about the CommDTM PROFIBUS DP-V1 opens.

Help

This function starts the »User Manual« in PDF format. Adobe Acrobat Reader is required. Installation of the Trebing + Himstedt DTM Library saves the user manual locally on your system.

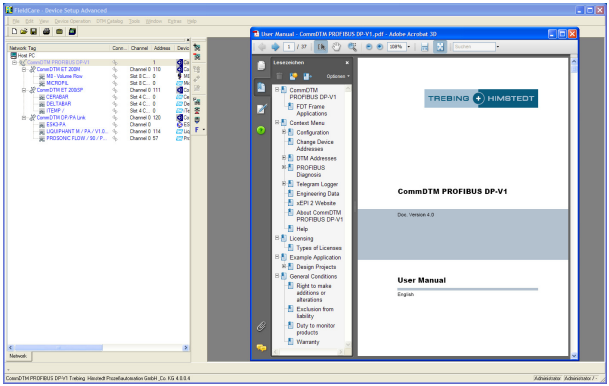

Fig. 12: User Manual

Licensing

The CommDTM PROFIBUS DP-V1 is protected by software key. When using the xEPI 2 hardware, the CommDTM PROFIBUS DP-V1 is already licensed. When using the CP5512 or CP5611 hardware, you need to license the CommDTM for unlimited use. Without licensing, you can use the CommDTM PROFIBUS DP-V1 as a demo version with unlimited functionality for 30 days from date of installation. After expiry of the 30-day demo version, online connections can no longer be established. At the time of expiration existing online connections will be terminated.

Note!
The license is generated for the current system. License transfer to other systems is not possible. You can find the current license status in the window **About CommDTM PROFIBUS DP-V1** (context menu: **>Additional Functions > About CommDTM PROFIBUS DP-V1**).

Types of Licenses

In the following table you find an overview of the types of licenses.

Type of license	Explanation
Demo version (... days remaining without functional limitations)	DTM is not licensed.
Trebing + Himstedt DTM Library Full License	License valid for all DTMs from the Trebing + Himstedt DTM Library.
Trebing + Himstedt DTM Library Single License	License valid for one DTM from the Trebing + Himstedt DTM Library.
No license (demo version expired)	No online connection can be established.

Example Application

Design Projects

Requirements

The following software has to be installed:

– FDT frame application
– Trebing + Himstedt DTM Library

The following hardware has to be installed:

– xEPI 2

FDT frame application

– Start the FDT frame application.
– Open and update the device catalog.
– Create a new project.

Add CommDTM PROFIBUS DP-V1

– Click **Host PC** in the project window with the right mouse key and select the function **Add device**.
– Select **CommDTM PROFIBUS DP-V1** from the device catalog and click **OK**.
– Configure the CommDTM PROFIBUS DP-V1.

Configuration of the CommDTM PROFIBUS DP-V1

– Open the CommDTM PROFIBUS DP-V1 context menu and select **`Configuration`**.
– Click the **`Search`** button and select a xEPI 2 of the list.
– Configurate according to your PROFIBUS network.

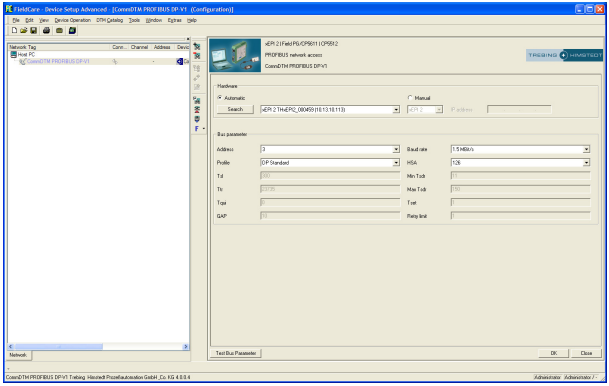

Fig. 13: Added CommDTM PROFIBUS DP-V1

General Conditions

Right to make additions or alterations

Trebing & Himstedt Prozeßautomation GmbH & Co. KG reserves the right to continue development of this user manual and the properties of the hardware and software at any time, also without releasing information about this or about alterations prior to doing so.

Exclusion from liability

Trebing & Himstedt Prozeßautomation GmbH & Co. KG assumes no warranty for proper function of the hardware and software in all conceivable situations. Currently available technical means do not enable the development of software which is completely free of errors in all conceivable applications. Trebing & Himstedt Prozeßautomation GmbH & Co. KG does not accept any liability for damages, both direct and indirect, arising from the use of the hardware and software and the information contained in this user manual.

Duty to monitor products

As part of our duty to monitor products, we strive to warn about dangers we have identified which can result from the interaction of hardware and software and product use with third-party products. Monitoring is only possible if we receive sufficient information from our customers on the planned application(s) and the existing hardware and software components. As a result of the complex interactions, it is no longer possible for us to accurately identify all dangers and to check the effect on the overall system and in particular on our hardware and software, if the conditions of application have changed and/or hardware or software has been exchanged. This user manual does not describe all technical characteristics of the hardware and software and their variants. For more information please contact Trebing & Himstedt Prozeßautomation GmbH & Co. KG.

Warranty

Our products are subject to warranty in accordance with our general business and delivery terms.